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NO. 298

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The American Peony Society Bulletin



Wind Chimes (Reath 1984)

Lavender, single hybrid, early tenuifolia, fern leaf, but foliage much broader than the species. Prolific amount of bloom.

Photograph: Klehm Nursery

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- *Tree Peony history*
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Compiled and edited by
Greta M. Kessenich;
photos by Roy Klehm
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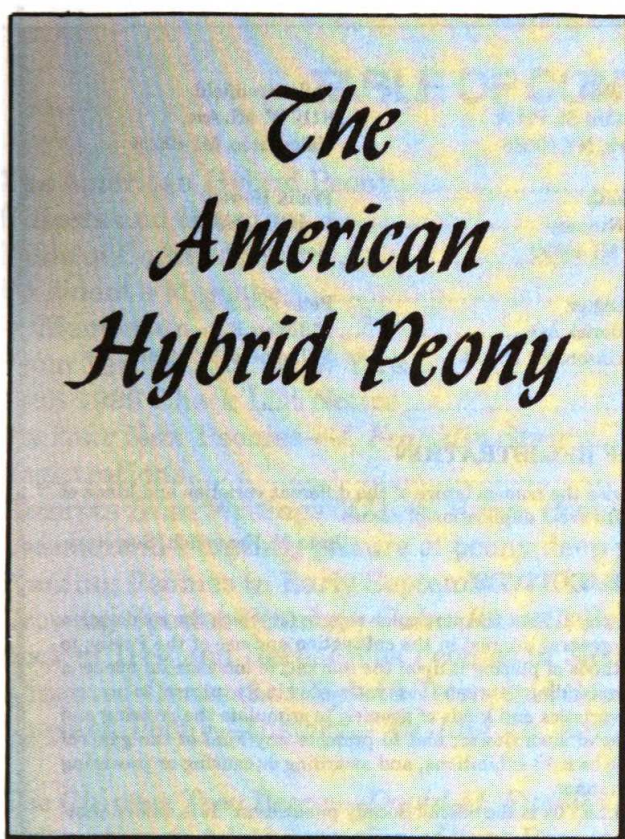
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DEPT. OF REGISTRATION

The department was formed to properly supervise the nomenclature of the different varieties and kinds of peonies. All new varieties should be registered to avoid duplication of names.

Greta M. Kessenich, Secretary

OBJECTIVES

The Articles of Incorporation state: Section (2) That the particular objects for which the corporation is to be formed are as follows: To increase the general interest in the cultivation and use of the Peony; to improve the methods of its cultivation and methods of placing it upon the market; to increase its use as a decorative flower; to bring more thorough understanding between those interested in its culture; to properly supervise the nomenclature of the different varieties and kinds of peonies; to stimulate the growing and introduction of improved seedlings and crosses of such flower; and to promote any kind of the general objects herein specified by holding or causing to be held exhibitions, and awarding or causing or procuring to be awarded, prizes therefor or in any other manner.

The AMERICAN PEONY SOCIETY BULLETIN is the official Society publication. It is mailed post-paid quarterly to all members in good standing.

MEMBERSHIP

The By-Laws state: All reputable persons, professional or amateur, who are interested in the Peony; its propagation, culture, sale and development are eligible for membership. Dues are as follows:

Single Annual	\$7.50	Junior or member family	\$2.50
Single Triennial	20.00	Life	150.00
Family Annual	10.00	Commercial membership	25.00
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Family membership, any two related members in same householdOne Bulletin

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For those who wish to further support the Society, the following special memberships are available.

Contributing	\$25.00	Supporting	\$100.00
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AMERICAN Peony Society Bulletin



June 1996 — NO. 298

TABLE OF CONTENTS

The American Hybrid Peony.....	1
Officers and Directors	2
Table of Contents.....	3
President's Message	4
In Memoriam	5
From Vernon Kidd, New York.....	6
1986-1996 Check List Notice	6
Register New Peonies— <i>J. Franklin Styer</i>	7
Registrations.....	7
Excerpts from Writings of G. W. Bunn, Peony Authority, past.....	8-9
Commercial Planting, picture of peony deep planting— <i>Myron D. Bigger</i>	10
Planting Peonies in Early September— <i>Gardening Illustrated</i>	11-12
Growing Species Peonies— <i>Galen Burrell</i> , Part I and Part II	13-17
Book of Tree and Herbaceous Peonies in Modern Japan	18
Advanced Generation Hybrid Tetraploid Seed— <i>Chris Laning</i>	19-21
Luoyang Peony—History— <i>Wu Jing Xu</i> , Agronomist, Luoyang City, China	21-23
The Chinese Tree Peony— <i>David M. Furman</i>	25-30
Cultivation & Administration of Tree Peonies in Pots By <i>Wu Jing Xu</i> , Agronomist, Luoyang, China.....	31-32
From Dr. Cheng Fang-yun, Northwest Normal University, Lanzhou, China	33
Introduction of Method to Propagate Tree Peonies Dr. <i>Cheng Fang-yun</i> , Dept. of Biology, N.W. Normal Univ., Lanzhou, Gensu China	33-37
From Writings of Clarence Lienau	38
Advertising	39-42

PRESIDENT'S MESSAGE

Dear Peony Lovers,

What a blessing to have Spring here at last, with thoughts of life rejuvenating the garden again. Now I begin to think of what to inter-plant with my peonies. The cosmos varieties, especially the dwarf 2-3', were good, as the foliage is light and flowers abundant. The asters leave a lot to be desired. Most of them are too tall and shade the peonies. Don't be tempted by the luscious raspberry flowers of Aster Alma Potschke as it flops all over. Some of the newer varieties are better behaved. Asters are neat, as they come on when the peonies are ready for dormancy.

A great deal of hybridizing is going on for Fall blooming perennials, and that will be just wonderful for us peony growers.

Once again, I'd like to urge you to plan on attending the annual APS Convention at Kingwood Center in Ohio—June 7-8-9, with your peonies. It is such an opportunity to see the flowers and the growers. I remember my first meeting at Kingwood when they were "setting up" the flowers on Friday night, and the amazing sight of seeing one of the Klehm girls with her baby slung on her back, getting the peonies in their vases. It was a touching picture! Or the memory of Joe Glocka and his daughter helping him set up, or the numerous couples like the Sindts, Schmidts, Lanings and Hollingsworths, all focused on the choicest of choice blooms for the exhibit. One year, Scott Reath arrived late from the U.P., but his stupendous tree peony blooms made it to the show table.

As the ad says, "the energizer keeps on going & going"... so the peony show energizes the participant for a good long while. See you there.

Sincerely,
Leila Bradfield

Seminar—2:30 P.M. Saturday-8th, Kingwood Hall, Service Room.
The mystery of the peony seed and its potential.—*Chris Laning*

Bulletin Cover—In Memoriam—Dr. David Reath.

Tree peonies: Exotic Era, Golden Era, Ruffled Sunset, Strawberry Delight and Waucedah Princess are pictured in color in the American Peony book.

DR. DAVID L. REATH

We are saddened by the loss of David Reath. He gave us so much—his knowledge of all horticulture, and of himself.

David Reath was born in Norway, Michigan on Oct. 21, 1927. He graduated from Michigan State University in 1952 with a D.V.M. Degree. During this time he worked in the greenhouses of the University. It was there that he developed an interest in horticulture. Returning to Vulcan, Michigan, he established the Reath Animal Clinic and practiced veterinary medicine for 42 years.

The Reath farm on County Road 577 was designated as one of Michigan's Centennial farms in 1974 after it was owned by the Reath family for 100 years. The farm was operated by several family members through the years, with David purchasing the farm from his brother in 1973.

It is now the Reath Nursery operated by David and Eleanor's son, Scott, and wife, Elizabeth. The family worked together in the propagating of perennial plants, specializing in both tree and herbaceous hybrid peonies.

David started breeding Standard and Intermediate iris—his interest continued with diploid Siberian iris. His most recent introduction of that type is **Waucedah Prince**. He continued on with this work as Helen Doriot and Lee Armiger interested him in hosta and rock gardening. A hosta was named for each of them. One of these beauties he named for his wife, **Eleanor Reath**. With his breeding accomplishments, he added successful work with daffodils, hemerocallis and Martagon lilies. He made noteworthy progress in Primroses.

This was only a part of David's work. His interest continued with the peony. With the friendship of Brother Charles Reckamp of Mission Gardens, Techny, Illinois, and Orville Fay of Northbrook, Illinois, David and Eleanor did some pollination there. Sixteen seeds were produced which developed the fertile new "Era series" tree peonies.

He developed and improved the tree peony grafting technique that brought rare tree peonies back into commerce. He used Colchicine treatment to induce polyploidy in peonies.

He was a member of the Board of Directors of the American Peony Society for over twenty-six years. He was a strict advocate of peony nomenclature.

He received the Saunders Memorial Medal for his exceptional work in plant breeding, and for his creative work in the advancement of the peony.

He died December 21, 1995. He leaves his wife, Eleanor, daughter Katharine (Dan) Peterson, of Iron Mountain, Michigan, three sons: Robert David Reath of Waupaca, WI, Roger Scott (Elizabeth)

Reath of Vulcan, Michigan, Mark Leland (Lisa) Reath of St. Albans, Vermont, two brothers and seven grandchildren.

Memorials can be sent to Children's Garden, Michigan State University, where a memorial plant will be established, or Grace Methodist Church of Norway, MI, or Dickinson Co. Chapter of the American Cancer Society.

—D. Steve Varner



FROM VERNON KIDD

500 West 43rd St., New York, NY 10036

The *Bulletin's* cover photo of Glasscock-Falk's 1955 introduction **FRIENDSHIP**, and the reported deaths of Elizabeth Glasscock Falk and David L. Reath, remind us of the beauty they contributed to the world. These living memorials remain to lift the spirit at this time of sadness.

My 1992 Reath Nursery catalog, dog-eared and underlined, show three of David Reath's more recent herbaceous peonies on the cover—**ROZELLA**, **WHITE FROST**, and the usually sold out, **PINK PEARL**. His breath-taking **WAUCEDAH PRINCESS** hybrid tree peony (1994), highly praised in Roy Klehm's tribute in the *Bulletin*, wasn't listed in the old catalog—it's in the new one. Our world is enriched by the caretakers of our favorite flower, who introduce the stars of the future, and answer the tantalizing question, "What if this is crossed with that?"

In my overcrowded garden, carefully considered Fall additions are miraculously finding a space in the crowd, and I hope Spring hurries to your beautiful garden, bringing all your peonies and roses back. Enclosed check is for a copy of the Table Top edition of "The American Tree Peony."

I'm looking forward to seeing you and all the others attending the exhibition in Mansfield.



Ten years have elapsed since our last checklist book, 1976-1986, was published.

There have been many Registrations since that time.

The 1986-1996 book will be published this year.

Should you have any cultivars that you have been anticipating naming and registering, do send them here by July 10th. This date gives you time to check your peonies at bloom time for the information required.

Greta M. Kessenich,
Registrar

REGISTER NEW PEONIES

The duty of the Society is to keep track of the horticulture of peonies, register all cultivars (C.V.) in the genus, and adjudicate controversy. It is expected to hold a basic record of peonies in commerce and gardens; that is, to list all cultivars in use.

The naming of species peonies is subject to botanical rules as published. The naming of cultivars, however, is the responsibility of the Society. Any new cultivar must be registered by the Society, which will apply the rules of the International Code of Horticultural Nomenclature and has authority to approve or deny the proposed name. The chief, but not the only, reason for this is the prevention of duplicate names, such as has existed for 'Venus' and many others.

The name must be approved before the cultivar is cataloged or sold. The cultivar may not be shown under an unregistered name in shows sponsored by the Society but may be shown under a number, tentatively.

The Society also has the right to classify cultivars, if felt desirable, and to name such classes—examples: "Itoh Hybrids," and "Tenuifolia Group." Since most cultivars are lactifloras, that group need not be presently expressly named. —J. Franklin Styer

REGISTRATIONS

INSPIRATION (D. Steve Varner, Monticello, Illinois), January 31, 1996.

Seedling number 6015 (**America x Moonrise**), Rose Scarlet hybrid, double row, single, waved and ruffled. A hybrid of good strong color of rose-scarlet. It has strong stems with one bud each. 31" in height, blooms midseason. Excellent pod and pollen parent.

CHERRY RUFFLES (Don Hollingsworth, Maryville, Missouri), March 20, 1996.

Seedling number Hollingsworth 1153. Parentage (Lactiflora double red from **Kickapoo** — Saunders' unnamed seedling of *Officinalis* cv x **Peregrina**). First flowered about 1978.

Cherry ruffles, herbaceous hybrid, semi-double cherry scarlet, blooms midseason. It has many ruffled petals around small center of yellow stamens. It has good substance, prolific amount of bloom on a compact bush of medium green leaflets somewhat curled and ruffled. 28" in height with excellent stem strength. It has stamens and pollen, and a mild fragrance. One bud per stem.

National Exhibit 1995, received Honorable Mention.

DARK EYES (Chris Laning, Kalamazoo, Michigan), March 20, 1996.

Itoh hybrid, parentage probably **Mikado** x *P. delavayi*. No seedling number since it was included in a batch of Itoh seed from Roy Pehrson about twelve years ago. The plant is vigorous and of dark green foliage that stays green until killing frost in the Fall. Its flower is dark purple, almost black, of medium size, and has a bright yellow center of stamens. Pollen viability is unknown. It sets no seeds. It is prolific and a great increaser.

Excerpts from the writings of G. W. Bunn, authority and peony grower of the past from White Bear Lake, Minnesota. This information answers many questions that have been received this past Winter and Spring.

For good peonies, spaced three to four feet apart—that will remain in the same location for a number of years—dig the hole 18 inches deep and that width. The lower half of the hole should have well prepared rich soil with a good handful of commercial fertilizer, the top half should have good garden loam. When the root is planted, it should not come in contact with any fertilizer. Fill the hole with water and let the soil settle.

Peonies grow in any good garden soil. If clay is your soil, peonies make slower growth and are less liable to suffer any root disease. When the peony hole is dug in clay soil, fill the hole with good garden loam, enriched at the bottom of the hole. If your soil contains too much sand, incorporate some humus and heavy soil. This is continuous with sandy soil.

When planting, the eyes of the peony should be two inches below ground level, filling the hole to the top with soil. For southern planting, the eye of the peony should be at ground level. A peony division planted correctly, with the good rich soil below, will send out small roots for the required nourishment.

The commercial grower with his large fields cannot go to this trouble and expense—and indeed does not need to. He plants to divide and sell his roots within three or four years; and good soil with a cover crop plowed under gives him an excellent field good for as long as he will need it. But the amateur, not planting for growth and sale of roots, ought to prepare his ground so his plants will be good much longer than four years.

Cover the eyes with two inches of soil as nearly as may be. Commonly a covering of litter is advised for the first Winter, not to avoid injury from cold but to prevent roots from being thrown out or moved by the frost. A better cover is a spadeful or two of earth, making a mound above the peony, having all the benefits of litter with the decided advantage of insuring perfect drainage. It throws the water away from the plant. The mound is easily removed in the Spring.

After good planting comes good cultivation. Peonies cannot be cultivated too frequently and ought to be gone over with a hoe at least after every rain.

During bloom and growth before bloom and during August when next year's eyes are being made, supply water if drought demands it.

No plant is permanent and while the peony is one of the longest lived perennials, it will not live forever. New plants must be produced by root division. There is no answer to the question: "How long should a plant should stand without division?" It ought to be divided

whenever it shows signs of deterioration. Too many, and thin, stems, are the sure signs and such stems mean inferior flowers. An expert peony grower never moves and replants a peony root that has stood for two years. Much better results are obtained by dividing. I think there is no question that a good division is better than a one-year-old plant. A one-year-old plant—unless its fine roots be trimmed off reducing it substantially to a division—will never produce as good results as a strong division.

★ ★ ★ ★

Over-fertilization is the most potent cause of failure. A little dressing of bone meal and wood ashes once a year, not too close to the plants and carefully worked into the soil, will be beneficial; but this should not be overdone.

The serious diseases of peonies are of the root, either root gall or rot. The security against these consists in planting clean stock in clean soil, and avoiding over-fertilization and bad drainage. Root disease has been cured by planting in clay, and dividing and replanting in clay.

Healthy roots cannot be grown and good results cannot be obtained from replanting in the same soil where peonies were previously grown.

When one must plant where a peony grew before, the soil should be taken out and carried away and new soil put in.

★ ★ ★ ★

It is easy for an amateur to show flowers, and more amateurs ought to exhibit flowers at the shows. A moderate number of flowers can be shown without much difficulty and an amateur who will take pains should be able to produce as good flowers as anyone. There is no difficulty in keeping flowers for the show two or three weeks. They should be cut at the proper stage of development and put in a refrigerator with the temperature at about 40 degrees. With a little experience, one learns the proper stage of development, which differs in different varieties. For example, **Festiva Maxima**, or any loosely-built flower, will develop properly in storage from a bud only partly soft to the fingers when cut. But tightly-built heavy flowers must be left on the plant until the flower is half or three-quarters opened. I think the late blooming peonies, as a class, require much fuller development on the plant before cutting than the early peonies.

For large blooms remove side buds—that is, leave only one bud on a stalk. This is disbudding.

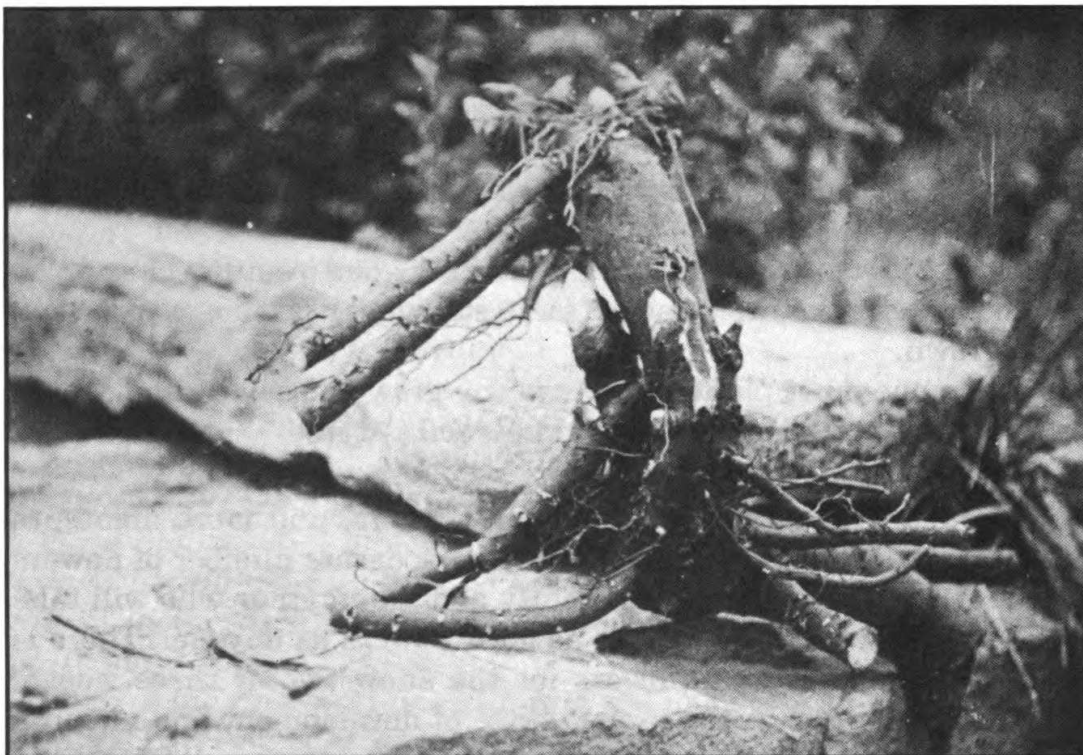
Blooms may be greatly improved in quality (after the bud has softened and partly opened) by putting over them either a one or two pound paper bag fastened with a pin or rubber band. This protects from the sun, the wind, the rain, and the dew.

For the commercial grower, when planting 1000 or more peony roots, prepare your ground as you would for potatoes, corn, wheat or any farm crop.

Plant your peony root in it with eyes up, two or three inches deep, and at a distance of three feet apart. Forget the fertilizer. When your plant is about three years old, give it a very small amount, and be careful about that—not too much.

Treat your plants just like you would your other peonies in the field. There is no mystery about planting a peony.

Bigger Peony Farm
Myron D. Bigger



Peony root planted too deep. It took two or three years for this root to establish itself and get the crown where it should be in order to bloom.

—Myron D. Bigger, 201 N. Rice Road, Topeka, Kansas 66616

★ ★ ★ ★

Spring is here and the gardening work is in progress. Seeds and seedlings are sprouting making this an exciting time. All sorts of parentages are involved, so as in the past. I'm looking forward to some excellent new peonies. Soon it will be time to plant lilac seed, about a quart. About 30 of the newer varieties are old enough to flower and set seed, so advances in syringa are expected.

—Chris Laning-Kalamazoo, Michigan; March 26.

PLANTING PEONIES IN EARLY SEPTEMBER

The cultivation of peonies is sometimes regarded as difficult because newly-planted specimens fail to flower. This is a fault which disappears naturally with age.

Peonies are not difficult to grow if you give them a generous start and bear patiently with their sparse production of bloom the first year or so. Plant them in well-drained, deeply-dug, and liberally-enriched soil and they will not fail you. When once well established, let the plants remain undisturbed and they will increase in beauty and productiveness as the years go by.

Planting may be done in September. If the soil be dry at the time of planting, give the plants a send-off with a heavy rose-watering can.

In their method of root production, peonies differ somewhat from the majority of herbaceous perennials. It is not commonly understood that, whereas the latter may continue to make new roots during several months of the year, herbaceous peonies have two definite seasons during which this process is carried on. The first is that of September, when the main roots are formed. The second is in Spring, when the fibrous roots appear on the Autumn-produced roots. It is obvious, therefore, that peonies can be best established in new surroundings before the main roots are produced, and the early part of September may, therefore, be regarded as the ideal time for transplanting these plants. To disturb the plants between the first and second periods of root formation, although not actually harming the plants, is bound more or less to delay the thorough establishment of them in the soil. In the case of peonies, which are essentially shy of blooming for a year or so after transplanting, due attention to this matter of timely planting should do much to lessen this well-known failing.

It may conceivably be argued that nurserymen who are, or who should be, familiar with the peculiarities of peonies, always advocate the extended planting season of these plants. From their point of view the line they adopt is reasonable enough, because it gives them a much longer period in which to reduce their stock, and it is certainly better for intending growers to avail themselves of the increased time rather than wait for another year to elapse. At the same time, for the reasons given, the early part of September should always be chosen when circumstances permit. It is hardly necessary to add that another factor for the better establishment of peonies is to secure for them right away a good rooting medium. This may be summed up in a few words—a deeply-dug soil that has been well enriched with a liberal supply of compost, bone meal, and a good watering if the soil be dry at the time of planting.

In size, in form, and in color, modern peonies may be said to have reached a state bordering on perfection. Every shade of crimson, rose, and pink, from the deepest to the most delicate of hues, besides pure white, primrose, and cream, may be looked for in an up-to-date collection of these plants. As to variety and beauty of form, you may have large full double flowers with petals of glistening silk, or you may have those cup-like blooms with huge centers of threaded tufts. But if your choice rests with single kinds, there are those enchanting varieties with centers of gold threads resting in a surrounding of wondrous shell-like guard petals. Finally, instead of the somewhat unpleasant scent which characterized the flowers of the old-fashioned species you have, in many kinds, a fragrance which equals that of any tea rose.

Of the utility of peonies there can be no question. Their proved hardiness and general immunity from disease and insect pests renders them excellent subjects for the permanent border. Even when out of flower they have their handsome foliage to recommend them. They do well among shrubs, and even under trees so long as their rooting medium is in no way encroached upon. Peonies are also well adapted for growing in beds on lawns with Spring-flowering bulbs planted freely among them.

Although the old double red peony has been superseded it is still often seen in cottage gardens.

It has been the custom of horticultural writers to admit that herbaceous peonies may be planted from September till March, and while it is quite true that the life of the plants is by no means jeopardized by transplanting them during the period named, it is equally true that the best results are achieved by planting peonies during a much more confined period; that is to say, as early in the month of September as possible.—From *Gardening Illustrated*



Official Business—

The members of the Board of Directors that have served their three year term and are nominees for continuing, Robert Wise, John Simkins, Leila Bradfield, Frank Howell and Chris Laning. This leaves two vacancies of which the nominees will be, Floyd Kimball—Stillwater, Minnesota for the vacancy of Alvin Sevald and the return of our veteran member of the Board, W.G. Sindt for the vacancy of Dr. David Reath.

Mr. Kimball is retired, grows many peonies and is a perennial exhibitor, a well known judge of peonies for many years, and an administrator of peony exhibitions.

GROWING SPECIES PEONIES

Galen Burrell, P.O. Box 754, Ridgefield, Washington

Part I — From Seed to Seedling

There are a great many ways to germinate peony seeds. Read the *APS Bulletin* over a few years or read some of the APS publications and you will encounter a myriad of techniques for germinating peony seeds. Just recently I received a letter from a fellow-peony grower that said she knew someone who hung peony seeds in a mesh bag in the reservoir of a toilet. Supposedly the filling and refilling of the tank helped the seeds to germinate. During the past seven years I have found three techniques that work for me. All are techniques that I have read about in the *APS Bulletin* but each technique has been modified through trial and error.

If species peony seeds are reserved in Winter, which so often is the case, store the seeds until late Spring or early Summer. Then soak the seeds in water for 4-7 days. Each day the water needs to be changed. Some of the seeds will get soft—throw those seeds away! Then sow the seeds in 1-5 gallon pots that contain organic potting soil which has been mixed with a little sand. For some species that need excellent drainage, i.e. *P. brownii* and *P. californica*, I put gravel in the bottom of the pots. After watering the pots, they are put on the north side of a fence in the dense shade of a tree in a hole that has been dug which is about two feet deep. (It's really just a cold frame that is dug into the ground). The hole helps to moderate extreme Summer and Winter temperatures. I'm convinced that if species peony seeds get too hot in the Summer they will not germinate. Keep the pots moist until it starts to rain in the Fall. If it gets too cold [below 20 degrees F], cover the cold frame. Using this method, *P. clusii rhodia* and *P. mascula hellenica* are the first to come up, in late January. The last to come up are *P. obovata*, *P. veitchii*, and *P. brownii*. As soon as the seedlings come up then move the pots to a sunny, south-facing location. When the weather becomes warmer, move the pots under a shade cloth where the seedlings will stay until they are planted out in early Fall.

Peony seeds do not always wait until the following Spring to come up in the pots. *P. californica* seedlings will often show their leaves above the potting soil a month or two after sowing. I have also had seeds of *P. mollis* and *P. obovata* start growing leaves in late Summer after being sown in pots in late Spring.

Species peony seeds do not need to be cold stratified before they will root germinate. In fact, placing peony seeds in a refrigerator before sowing is a waste of time. Some species like *P. brownii* and *P. tenuifolia* need fairly cool temperatures to germinate, but do not need to be cold stratified.

The second germination technique I use is the simplest and I'm sure the one most commonly used. Instead of putting all the peony

seeds in pots, sow them in a raised bed that is in at least 1/2 shade (seeds planted in at least partial shade seem to germinate better than those in full sun). Plant seeds 3-4 inches apart.

There are two advantages to this technique. One is that the seedlings do not need to be transplanted like those in pots, which means they grow a little faster. Second, a raised bed does not need to be watered as frequently as a pot.

The best time to plant seeds in a raised bed is late Spring, or at the same time they are sown in pots. Species peony seeds sown at this time will often have close to 100% germination.

I also use this technique in Fall (as late as October) for seeds of *P. californica* and *P. brownii*. Seeds of these two species planted in the Fall will come up in the Spring. For me, seedlings of our two native peonies grow better in raised beds than they do in pots.

I also plant species peony seeds that have been freshly collected from my garden in a raised bed. Some of these seeds will come up the first year after planting and some will come up the second year. Germination of freshly collected peony seed varies greatly by species. I have had 100% germination with *P. japonica* seeds the first Spring and 0% germination of *P. obovata* 'alba' seeds the first Spring.

Species peony seeds are often received in October or November. This is too late in the Fall to use any of the outdoor techniques. So I soak them in water for 3-4 days and put them in quart bags filled half full with vermiculite. The trick is: don't put too much water in the vermiculite. If you do, when the roots start to grow they will begin to rot. Then I put the bags in a basement room that has a constant temperature of 70 degrees F. Leave the bags at 70 degrees F for 30 days. Some species and hybrid seeds will germinate at this temperature. In fact, I have had *Paeonia broteroi* seeds germinate in as little as 15 days at 70 degrees F. Hybrid seeds of *Paeonia suffruticosa* will also sometimes germinate in less than 30 days at this temperature.

After 30 days I put the bags of seeds in an attic room with a temperature that fluctuates between 55 and 60 degrees F. Some species seed will begin to germinate in just a few days at this temperature. Other seeds will take up to 2 months to germinate. The only species whose seed I have never gotten to germinate at these temperatures is *Paeonia obovata*. Generally there are a few seeds in each bag that will not germinate in two months so I save these seeds and use them in outdoor germination techniques.

When the seeds have grown a root which is 1-2 inches long I put the bags of vermiculite in a refrigerator. Some roots will grow faster than others so you might have to have two bags for each group of seeds, one at 55-60 degrees F, and one in the refrigerator. The seeds at 55-60 degrees F should be checked weekly and moved to the bags in the refrigerator when their roots have grown long enough.

Within 2-5 months the first leaf will start to grow on the root germinated seeds in the refrigerator. Before the leaf starts to open and generally when the shoot is 1/2-2 inches long, depending on the species, I plant the seedlings 2-3 inches apart in a 1-2 gallon pot. Then, put the pot in a shady location outdoors until the leaf appears above the potting soil. Once that occurs, move the pots to a sunnier location. If all goes as planned, the seedlings are being put outside during the warm days of Spring.

One common misconception about peony seed germination is that peony seed won't germinate the first year if it is dry. This year I received seed of a species of wild tree peony from two sources. One batch of seed was sent to me moist in a little bag of vermiculite and the other was sent to me dry. I used the vermiculite technique on both batches of seed and I had better germination with the dry seeds than with the moist seeds. For some species peonies it appears that drying might actually enhance germination.

I've also planted dry *P. veitchii* seed the same day that I collected it. This was in early August. Surprisingly, most of the seeds came up the following Spring but a few did not come up until the second year.

Which of the three species peony seed germination techniques I use is generally dictated by when I receive the seeds. If I, however, only have a small number of extremely rare peony seeds, I will often try to germinate them by using two different techniques. Hopefully, my chances of germinating at least a few of the seeds is much better.

So far, I have only received one packet of species peony seeds that has refused to germinate using all three techniques. It's been two years, but I still have not given up hope that at least one of the seeds will germinate. I think here lies the key to species peony seed germination—PATIENCE!!

★ ★ ★ ★

GROWING SPECIES PEONIES

Part II — From Seedling to Flowering

There are nearly 70 species, subspecies and varieties of wild peonies. They grow in a wide range of habitats, from the alpine in Turkey to nearly sea level in Cyprus and Crete, from the Kola Peninsula in Northern Finland to the basaltic cliffs of Majorca, and from the canyons of Los Angeles to the Tsangpo River Gorge in Tibet.

Because wild peonies grow in such a wide range of habitats throughout the Northern Hemisphere it makes sense that it would be nearly impossible to use only one method to grow all wild peonies. In my garden, which is 16 miles north of Portland, Oregon, I have, through trial and error, found cultivation techniques which work for most of the wild peonies. These exact same techniques may not work in your own garden due to differences in soil, climate, etc., but they should give you a good starting point for growing these graceful and beautiful plants.

In late August or September, I remove the seedlings from the pots they have been growing in all Summer, and transplant them to raised beds. The raised beds are constructed so that the seedlings will have very good drainage and will be protected from moles, cats, children, birds, and any number of other potential hazards. Seedlings planted in the open garden do not survive as well as those planted in raised beds. They also do not grow as fast as those in raised beds.

Inevitably a few seedlings will not survive the first Winter. The primary reason they do not survive is frost-heaving. Seedling roots are easily pushed out of the ground by this heaving action. If they are not quickly planted back into the ground they won't survive.

Once wild peonies are two to three years old, I move them to their final home in my garden. Most species peonies transplant best at this young age. As they get older and their root systems grow larger they become fairly intolerant of root disturbance. For example, older plants of *Paeonia cambessedesii* can sometimes take three years to recover from transplanting, while young plants transplant without any noticeable check in their growth.

The least demanding wild peonies for me to grow are *Paeonia delavayi*, *Paeonia lutea*, *Paeonia potanini*, *Paeonia potanini* var. *trillioides*, and *Paeonia lutea* subsp. *ludlowii*. I simply dig a hole in some of my better clay-loam soil and plant them like any other shrub, making sure to spread the roots out over a mound made in the bottom of the hole. Then fill the hole with soil and water. I do not amend the soil or worry terribly about drainage. Their only requirement is that the planting hole be dug in partial shade, since they do not like full sun or a warm position on the south side of my house.

Paeonia anomala, *Paeonia mascula* subsp. *triternata*, *Paeonia lactiflora*, *Paeonia officinalis* subsp. *villosa*, *Paeonia mlokosewitschii*, and *Paeonia mascula* subsp. *arietina* can be grown just like "lactifloras" and hybrids. A hole is dug in a sunny place in my garden. Then I discard the heavy clay soil that was dug from the bottom of the hole. In the bottom of the hole put 2-3 inches of well-composted steer manure. Next, mix the soil from the top of the hole with commercial topsoil (compost if I have it), sand, and a handful of bone meal and fill the hole with this mixture. The peony root is planted at least a couple of weeks later on a mound (a mound will help with drainage) in the center of the hole.

Some species can be grown in the above manner with one major difference—they must have shade from hot afternoon sun. These species include: *Paeonia obovata*, *Paeonia obovata* 'alba', *Paeonia veitchii* and its varieties, *Paeonia ruprechtii*, *Paeonia lagodechiana*, *Paeonia japonica*, *Paeonia wittmanniana*, *Paeonia mascula*, and *Paeonia peregrina*. In the wild, these species grow in the shade of shrubs or under an open canopy of deciduous trees.

Most of the Mediterranean species including *Paeonia cambessedesii*, *Paeonia mascula* subsp. *russoi* and *Paeonia clusii*, and one of our native peony species, *Paeonia californica*, need a warm position and excellent drainage. They also need some shade from the hot afternoon sun. I plant these species on the south side of my house in the shade of two crape myrtle trees. They are planted in raised beds that have been filled with equal parts compost, sand, and commercial topsoil. I also add some turkey grit to improve drainage and a handful or two of bone meal. It is important that the raised beds be at least two feet deep so the peony roots will have room to grow.

Paeonia cambessedesii also does well in other locations in my garden as long as it has very good drainage.

The large-flowered tree peony species such as *Paeonia rockii*, *Paeonia ostii*, and *Paeonia jishanensis* need very good drainage. If the soil they are planted in retains too much water they will succumb quickly to fungal diseases. So I grow these tree peonies in either raised beds (without clay soil) or on a steep slope in planting holes that contain my own compost, sand, grit, commercial topsoil, and some of my best clay-loam soil. I also add a little bone meal and lime to the planting hole.

Probably the most difficult species peony for me to grow well is *Paeonia brownii*, one of our native peonies. After a great deal of trial and error I now use two methods for growing *Paeonia brownii* in a raised bed or on a mound. Both methods require that absolutely no clay soil is even in sight of the planting mixture. The raised bed is made of large flat rocks (the rocks probably add warmth to the soil) and is filled with compost, peat moss, sand, commercial topsoil and some grit. Although the bed is in full sun it receives afternoon shade from a small shrub. The mound is 8-10 inches high and is made up of the same planting mixture used in the raised bed. It has a western exposure with no afternoon shade. I have had plants of *Paeonia brownii* that were grown from seed bloom on the mound and in the raised bed.

These two methods also work well for growing *Paeonia tenuifolia*, as long as it receives afternoon shade.

Paeonia hybrida is the only species that I have found to be nearly impossible to grow in my garden. However, it grows extremely well in my parent's garden in Iowa. *Paeonia hybrida* grows in the harsh steppe climate of Northern Mongolia, so quite possibly it needs colder Winter temperatures than can be found in my garden.

The key to growing any peony species well is to learn a little about where a particular species grows in the wild. Then use this information to experiment in your garden.

Species peonies are a bit more difficult to grow than "lactifloras" and hybrids, but their charm, elegance, and beauty more than make up for the extra care.

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ADVANCED GENERATION HYBRID TETRAPLOID SEEDS—WHAT ARE THEY?

Chris Laning, Kalamazoo, Michigan

The following letter was written to Prof. H. W. Fawkner in Sweden by Chris Laning, regarding the parentages of seeds sent to Sweden:

All seeds have been collected from advanced generation tetraploid clones with the exception of lactifloras. Seeds were, and are, being produced by mixed parentages, such as Saunders Quad F3's and F4's pollinated by **Archangel, Moonrise, Silver Dawn F3 lobata** hybrid clones, **Sunny Boy** and **Sunny Girl**, etc. Back-crossing, in-breeding, and open pollination are methods used. It may seem to you that the resulting seeds are a hodgepodge of mixed-up parentages, but a whole vista is now available. New and more vibrant colors result from the greatly increased gene pool. The expanded opportunities for new phenotypes should excite hybridists.

Records of various crosses are general—not scientific—which makes the average hybridist unhappy, but for me individual superior clones for introduction is not my goal. Results are obtained by the rise of populations, that is, by raising large groups of seedlings and selecting from them, goals can be reached. Only by this means can "advanced generation" seeds be offered, and I doubt that there is another place in the world that gives such treasures!

The American Peony Society has "*Hybrid Peony*" book for sale, a great source of general information. If you don't have it, get it! Other books are offered, also, and listed in the "*Bulletin*." Get them, too!

The new editor of *PAEONIA* is Donald R. Smith, 46 Exeter St., West Newton, MA 02165. He is dedicated to the Intersectional Hybrids. We call them the Itoh cross since Mr. Itoh of Japan first made the cross and showed us its possibilities. The cross is lactiflora x lutea tree peony hybrids.

Hybridizing for Itohs is one way to retard the progress of peonies. When successful, a new beautiful clone may be obtained but fertility is lacking. A genetic breakthrough is needed if ever it is to become a tool of the hybridist.

* * * * *

Horses are beautiful and they can reproduce.

Mules are real friends of our farmers—
but they don't reproduce.

Peonies that don't set seed are mules.
They don't have children so they spend
their whole life looking pretty.

Progress for them is zero.

Roy Pehrson spent many years accumulating what he considered the best of Professor Saunders' experimental crosses that seemed to

have greatest potential for a gigantic gene pool. By continuing hybridizing, Roy improved fertility of seedlings and seeds.

ADVANCED GENERATION TETRAPLOID SEED:

Upon looking at my old records, I found the answer to the question which many people have asked—and others are still asking—**"Just what are advanced generation seeds and plants?"**

In 1976, the late Roy Pehrson sent me seeds from many of his crosses. I think he decided to put forth a major effort in making the "Itoh Cross," presenting me the treasured gift! Here is the list of the two-year-old seedlings he sent:

Serenade F2 — 22 plants
Quad F2 x Roselette's F1 — 50 plants
Quad F2 x Moonrise F2 — 50 plants
Quad F3 — 8 plants
Petite Rene x 8969 — 4 plants
Sable x Super D — 4 plants
Horizon F2 x Super D — 2 plants
Chalice x lobata — 14 plants
Name lost — 30 plants
Mauve Bomb — 8 plants
Lactiflora x Lobata — 34 plants
Vesper x Archangel — 25 plants
Roselette's Child F3 — 31 plants
S. S. Mix — 28 plants
Archangel — 25 plants
Sable x Lobata — 9 plants
Rushlight — 42 plants
Archangel x Nancy — 7 plants
Quad F3 — 33 plants
12128 — 18 plants
Battle Flag x Red Red Rose F2 — 13 plants
Nosegay F2 — 21 plants

Total 470

T.P. 86 - 74 - 65

225

Grand Total 695

MY 1994 PEONY SEEDLING LIST:

Picotee seedlings—1995 and 1996—10 plants growing in pots now

Dwarfs, also Laura Dessert x (Emodi x Mloko) seedlings 1994 ("Unusual and difficult"—Roy Pherson)

Nosegay F4 **F1—Playmate (Saunders)**
F2—Nosegay (Saunders)
F3—yellow (Laning)—with no tenui showing
F4—wait and see—1994 and 1996

Apparently the tenui part of the original (Saunders) cross has dropped out, so now what is left is a tet. **Mloko**.

Eugene Screwball—Brown, Pennsylvania, or another place—small white with red stripes, fertile hybrid (like mine). This crossed with mine; hasn't bloomed yet.

Halcyon F1

Saunders, **F2—Saunders**

F3—Lanings

F4—Lanings (look real good!)

P. delavayi—open pollinated with purple suffruticosa—about 200 seedlings; results as yet not known.

P. lutea—same as above—30 seedlings.

Tetraploid hybrids—seedlings from yellow flowered varieties—soon will have a whole bunch of them.

Classic Crimson—my new introduction; the parent plants are too tall but fertile—lots of seedlings this year. Pollen parent **Nosegay F3** and some selfed.

Mary Jo Legare—Roy Pehrson's **Mikada x ?** Pollen good. Only two seeds this past year.

Lanings' **"Sunny Girl" x "Sunny Boy"**—seedlings should offer something good.

The reciprocal—**Sunny Boy x Sunny Girl**, should be tried this year.

★ ★ ★ ★

LUOYANG PEONY — HISTORY

*By Wu Jingxu, General Manager and Senior Agronomist, working in
Luoyang Huafeng Ltd. Co. of Peony & Horticulture*

(Address: No. 3 Daonan Rd., Luoyang City, China)

Luoyang is one of the seven large ancient capitals, and one of the three big historically-famous cities of China. It has been famous for its rich resources and outstanding personalities all over the world. Luoyang Peony is just like a bright jewel being set on the thirteen dynasty capitals and is the cradle of Chinese culture.

Peony is also named "Bai Liang Jin" (A Hundred Liang [5000g] Gold), "Rich flower," "Luoyang Flower," etc. Peony has many varieties. It's a deciduous small arbor of the distantly related Ranunculaceae *Paeonia*—now classed as a family of its own, *Paeonaceae*. Peony is a worldwide famous flower which has its origin in China. The flower is very large, elegant and poised, gorgeous and sweet-smelling. It is rich in branches and leaves which are straight and regular. Enjoying the beauty of Peony, people have a sense of talcum, and they are good-looking. Since ancient time, peony has been named "the king of flower" and "national colour and heavenly flower," and symbolized as luck, happiness, riches, honor, peace, friendship and prosperity. It has been also named "the national flower." Now it also has been chosen a "China flower." It is widely planted in many countries all over the world.

Peony is a very precious flower; it has many usages. Social, economical, and ecological benefit is obvious. Peony may be planted

both in flower pots for decoration and in flower beds to beautify the environment. Being used as a medium, it may aid the development of economy, and friendship, or used as a precious gift it can be presented to honored guests and friends. The root of peony contains volatile oil whose main composition is Chinese peony phenol and Tree peony phenol anhydride, benzoic acid and phytosterol, which is also an effective component used to make several kinds of antibiotics. The skin of peony roots is used in traditional Chinese medicine named "Danpi" whose taste is "pungent," slightly "cold." It can enter three "channels": heart, liver and kidney. It has many good effects such as antipyretic, cooling blood, invigorating the circulation of blood, lowering blood pressure and melting ecchymosis, etc. It is made into such good medicines as "the peony powder," "the soap of the Chinese rhubarb and peony" and "peony and cape jasmine free pill." These medicines may treat many diseases, for example, weak and amenorrheic, fever after noon, intestineache, headache, menstruation ache, dizzy, high fever and spitting blood, tongue red, injuries from falls, high blood pressure, etc.

Peony's petals are mixed with other raw materials, then wrapped up in flour cloth to be fried, or after being boiled, mixed with vegetable, vinegar and fresh yolk sauce to make a beautiful food, and also make a "peony bath pool." It gives people good enjoyment.

Luoyang land is most suitable for growing flowers, among which the peony is the most wonderful. In Luoyang, the climate is temperate, the rainfall is moderate, the soil is fertile. The ecological environment is richly endowed by nature. Besides, through the horticulturists of many centuries ingeniously cultivation from the past to the present, Luoyang peony is always the most famous both at home and abroad. According to records, long long ago (for example, the Northern and Southern Dynasties, the Sui and Tang Dynasties), only China planted peonies in the world. The peony in China were mainly grown in Qingzhou (now Shandong Province), Yuezhou (now Zhejiang Province), Yanzhou (now Yanan area) and Danzhou (now Shanxi Province). But comparatively speaking, "Luoyang peony was the best."

Today, peony plantations in China still occupy the first place in the world, and Luoyang is still one of the main growing area of the China peony. Luoyang peony is most prosperous and has a well-deserved reputation. Years ago, at "the flowers fair" and "the city's flowers fair" being held in China, and at "the international flowers fair" being held in Hong Kong, Luoyang peony continuously occupy the supermacy and is chosen as the nation flower.

During every blooming season, Luoyang peony is blooming like flower sea. Its sweet smell assails the nostrils, the radiant splendor is unrestricted. Peony flowers compete with each other in blooming and color. Presenting a splendid scenario, Yaohuang is splendid, graceful, shining light. Weizi is dazzlingly brilliant and the most

beautiful; Erqiao is graceful and unsurpassed all over the world; Xue-ta looks like the white jade, and Doulu has the color of jadeite, etc. Looking broadly at the flower bed, it is a blanket of brilliant purples and reds, a riot of color, beautiful and splendid, and is especially enchanting. In the downtown area and the outskirts of Luoyang city, crowds of people look like tide water, and traffic becomes very busy. Everyday there are as many as 100-thousand visitors who come here from both home and abroad to appreciate the beauty of the peony, and at peak time the amount can reach 200-250-thousand. Many visitors are from far far away; they are attracted, toppled over, and intoxicated by the beauty of the peony.

Luoyang peony has already been planted for 3000 years, and is always correlated with the rise and fall of a nation. According to historical records, it began in the Sui Dynasty. At that time, there were only several hundred peonies with twelve varieties. The color varieties were very few, and only had three: yellow, pink and red. At that time, peony still had some wild properties. Up to the Tang Dynasty, varieties increased to 11, and amounts increased up to about one-thousand. There were five color varieties: yellow, white, pink, red and purple. Up to the Song Dynasty, the varieties increased sharply up to one-hundred and fourteen, the amount increased to about ten-thousand, and also the colors increased two more kinds: green and compound color.

After the Ming and Qing Dynasties, peony was slowly decreasing. Before the liberation of China, peony was on the verge of extinction. After the founding of New China, peony again gained new life, and recovered very fast. Since the eleventh and the third central plenary session of the party, the development of peony is more rapid. Now, the peony is planted widely in parks, streets, factories, offices, and schools in Luoyang. Besides, many specialty villages and families in suburban town and villages plant peony commercially. The whole city has big and small peony more than ten-million with eight-hundred varieties and nine color varieties (red, purple, white, pink, blue, green, yellow, black and compound color), three petal kinds (single petal, half-double petal, and double petal), and eleven types (single petal type, lotus type, sunflower type, rose type, standard peony flower type, flat globe type, long globe type, big leaf hydrangea type, crew cut stage-garret type, and floor stage-garret type). The planting area has reached about ten thousand "mu."

Every year one-million new peonies are produced and sold to over twenty provinces, cities, autonomous regions and countries, like Japan, Singapore, Australia, New Zealand, France, Hong Kong, and Aomen, etc. Therefore, it brings Luoyang income for several million yuan.

In September 1982, the Standing Committee of the People's Congress of Luoyang city adopted a resolution to name peony as "city

flower" of Luoyang, and determined that from the 15th to 25th of April in each year be "Luoyang peony show." On the occasion, people in the field of economy and visitors from all over the world will gather in Luoyang to appreciate the beauty of the flower, go sightseeing, take part in economic and technical meetings, science interchange, activities and trade fairs. The "Peony Flower Show" also brings remarkable economic and social benefit to Luoyang. Since thirteen years ago, resulting only from this, we have received over 30 million guests both from home and abroad, and directly creates over ten-hundred million yuan revenue. Volumes of business of economic technology amounts to 300-million or so. At the same time, being "medium," "tie," and "bridge," between Luoyang and other regions, peony show helps Luoyang show itself to the outside world, widely make friends, strengthen crosswise connection, and also help people in town and countryside get rid of poverty. Peony show not only promotes the development of economy, but also promotes the development of two civilizations.

Luoyang peony has also made a great contribution to the development of world peony and culture advance. According to some investigations, at present, most peonies in the world are directly introduced or selected from Luoyang peony, and wild peony in Sichuan and Yan'an. In China from northern Heilongjiang, Jilin and Liasning Provinces to southern Guangdong, Guangxi, Fujian and Yun'nan Provinces, from western Xinjiang, Gansu to southeast Provinces and cities stretching to the coast, peony planted there were all introduced from Luoyang. At aboard, Luoyang peony was brought to Japan in A.D. 724. Later, through a long period of selection, Luoyang peony developed into many new varieties, and largely exported to England and America, etc. In A.D. 1656, peony was brought to Netherlands. In A.D. 1788, peony was brought to the Surname Garden of England. During A.D. 1800 to 1850, France began to introduce peony, and carried out a breeding selection and improvement work, so that many new varieties were created.

In 1820, England began to introduce peony seedlings from France, and carried out seedling breeding. At the beginning of the 20th century, France was successful on the hybridization between peony and yellow peony, and selected an amount of bright yellow interspecies-hybrid peony, and ushered in a new epoch of peony breeding improvement.

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CONVENTION AMERICAN PEONY SOCIETY
Kingwood Center, 900 Park Ave. West
Mansfield, OH June 7-8-9, 1996

THE CHINESE TREE PEONY

(A Feast for the Eye and Soul)

by David M. Furman, Cricket Hill Garden

To walk in a garden in which a Chinese tree peony is blooming is like stepping into a traditional Chinese scroll painting. The Chinese have long appreciated these flowers and have produced a wealth of monographs, comments, and poems on them. Themes have ranged from their proper cultivation to the abstract meanings. Seeing them in bloom focuses the eye and engages the senses.

"The nobility and gentry of the capital city have been making excursions to admire the tree peonies for about thirty years past. Every evening in the Springtime the carriages and horses take madly to the roads, it being considered shameful not to spend some leisure time in enjoying them."

Li Chao 860 A.D.

These classical plants are mentioned as early as the 4th century A.D. and by the Sui dynasty (590-618 A.D.). They were grown in great numbers in the Emperor's gardens. They differ from their more common relative, the herbaceous peony. Unlike the herbaceous peony, the tree peony (in Chinese-mudan) is a woody shrub that does not die back in the Winter. Its branches and stems consist of woody material with shaggy bark, rather than the smooth green stems of the herbaceous peony. Tree peony leaves are larger and more complex.

"The mudan have a nature preferring cold to warmth, and dryness to moisture. When transplanted, the roots flourish. They are happy facing the sun, but putting them half in sun and half in shade is called 'nourishing the flowers.' Planting them at the best time, and (knowing the methods of) grafting and pruning is called the 'handicraft of the flower.' If they get shade and watering just right, with transplanting and grafting according to the art, flowers can be produced with several hundred petals and measuring a foot across. When expert gardeners select the best sorts for planting, and every detail is correctly managed with care, then the flowers will flourish abundantly, and among them there will arise marvelous new grades (of forms and colors) by spontaneous transformation."

Ou yang Hsiu 1007-1072 A.D.

During the next dynasty, the T'ang, the mudan became so popular that it was comparable to the tulip and the tulip mania of the Dutch in the 17th century. At that time the tree peony was incorporated in numerous gardens and gained the reputation for representing sensual beauty as well as wealth. Two poems of the period say it well:

The Flower Market

*In the royal city Spring is almost over,
Tinkle, tinkle - the coaches and horsemen pass.*

*We tell each other "this is the peony season"
And follow with the crowd that goes to the flower market.
Cheap and dear - no uniform price;
The cost of the plant depends on the number of blossoms.
For the fine flower, a hundred pieces of damask;
For the cheap flower, five bits of silk.
Above is spread an awning to protect them
around is woven a wattle-fence to screen them.
If you sprinkle water and cover the roots with mud,
When they are transplanted, they will not lose their beauty.*

*Each household thoughtlessly follows the custom.
There happened to be an old farm laborer
Who came by chance that way.
He bowed his head and sighed a deep sigh;
But this sigh nobody understood.
He was thinking, "A cluster of deep-red flowers
Would pay the taxes on ten poor houses."*

Po Chu-l 810 A.D.

The Blossoms of Luoyang

*My lover is like the tree peony of Luoyang.
I, like the common willow.
Both places love the Spring wind.
When shall we hold each other's hands again?*

*Incessant the buzzing of insects beyond the orchid curtain.
The moon flings slanting shadows from the pepper-tree across
the courtyard.
Pity the girl
Who is not equal the blossoms
Of Luoyang.*

Ting Liu Niang approx. 915 A.D.

Gardens in western culture serve diverse purposes. They are usually used as a fashionable surrounding to a dwelling. In China they were, and still are, considered "High Art" on a level with painting poetry and architecture. In the classic Chinese garden, flowers are never thought of as the emphasis of attention. A Mandarins' garden was laid out to abstract the elements of nature. Rocks, water, and trees were planned to represent the "natural world." Little emphasis was given to beds of flowers. Yet the mudan flower quickly found a permanent place. Today there are stands of mudan that are hundreds of years old stretching from Shanghai, through Suzhou, to Beijing, and Luoyang.

In the United States it thrives from the southern part of zone 3 (southern Minnesota) to zone 9 (Los Angeles or Orlando). Part of the misinformation about tree peonies is that they must undergo freezing conditions in order to bloom. We know of many gardens in Texas, Southern California, Alabama, etc. that have excellent blooms even though the ground does not freeze. We correspond with the largest tree peony nursery in Australia, located in Tasmania, where their ground never freezes. The confusion arises because many herbaceous varieties have the requirement of freezing. At the other end of the scale, we know of gardens where the Winters are so severe that the stems of the mudan die back to the ground each year. Each Spring they grow back, and in older plants produce some flowers.

Species plants of the present garden cultivars come from the mountainous regions of northwestern and southwestern China. These areas are not lush with growth but are dry and windswept. As a consequence, the peony plants must have a well drained planting area. Any standing water will kill them. The Chinese gardeners are well aware of this characteristic. In many Chinese pictures showing tree peonies, we see plantings in raised beds, very large pots, or a raised area surrounded by 11 2-foot tile walls. At Cricket Hill (our garden) we use all the above mentioned methods as well as planting on gentle slopes.

Mudan are not fussy about pH. They like a range from about 6.5 to 7.0. They do well in both clay or sandy soils. Since the plants produce a large quantity of flowers and leaf material, they do best in rich composted soils. In our own collection, we further feed with a weak solution of fish-seaweed solution about every ten days after the leaves turn green but before the flowers open. This gives the plants the boost they love in the Spring. After flowers have faded, we continue to improve all soils in our garden with compost.

We are fortunate to have close access to a commercial composting facility (New Milford Farms). They produce a compost made from food wastes and forest products. It has a pH of about 7.0 and a nitrogen content of 2%. We must prefer a slow acting compost with a wide spectrum of nutriment rather than the simplified and concentrated fertilizer formulations. (More comments on the topic of soil building and improvement in future discussions).

After blooming we dig a trench one foot wide and one foot deep at the drip line going away from the plant. We fill this circle with the compost. Do not use fresh manures. Composting encourages the plant to grow outward toward its food. How the plant "knows" where its food is to be found is for a botanist to describe. It is enough for the gardener to know that it happens. You will know it by the health and size of your flowers and plants. The mudan will grow and bloom under various garden conditions; however, if you wish to maximize

growth and flowers you must provide plants with maximum conditions. One of these is proper food.

Chinese gardeners have had centuries to select cultivars with an extensive range of desirable characteristics. Some mudan produce miniature flowers (*Mini Hu's Red*, for example). Others were selected for their small (4 foot height) profile. Plant height ranges from 4 to 10 feet height. The density of plant structure also varies. Most garden cultivars have a fullness to their structure. Open structured plants are often those closest to the species, and are often white or light pink. The topic of cultivars and species, their taxonomy and naming, are presently undergoing much scrutiny and are ripe for change. It is for this reason we have avoided using the traditional botanical name *Paeonia suffruticosa*. It is another topic for future discussion.

The characteristics of flower color and shape are the mudan's main attractions. Flower sizes range from 4 inches to an almost unbelievable 12 inches in diameter. Additionally, some flowers grow to a depth of 5 inches! Often the flowers do not reach their full size until the plant is eight or nine years old. Most will begin flowering in their fourth or fifth year. A few, such as **Pea Green** take even longer. We kid our customers by telling them we will not sell **Pea Green** to anyone older than thirty. Another peculiarity of the plants is that many will bloom in a variety of different flower shapes during the same blooming season. **Zhao's Pink** often blooms with both light semi-double flowers as well as a thousand petal types. Many of the plants that have double type flowers have significantly different shapes on the same plant. A most interesting effect.

We agree with the Chinese gardeners' descriptions of flower shapes. Some are easy to understand; singles, semi-double, double. It is within the double that the matter becomes complex. We describe double as a shape like a cabbage rose. It has many petals with few or no carpels or stamens showing. The ruffled ball shape looks like its name, shaped somewhat like the double but much more rounded. The crown shape has a flattened row of outer petals with a ball of petals at its center. The thousand petal shape is a cylindrical-shaped flower with numerous petals, perhaps not a thousand, but indeed many hundreds. The ruffled shape has twisted petals, rather than symmetrical ones as seen in most flowers. See the centerfold of our catalog for illustrations of each of the shapes. Added to color, this combination of shape and size has brought the mudan to its present prominence.

In describing flower color it is best to first comment on the luminosity and texture of the petals. The Chinese often call them waxy or silky—a comment made by many of our own garden visitors. The colors seem to shine through the petals perhaps because the color often changes from the face of the petal to its back. Flowers often have veining of somewhat different shades. Flowers may be seen in pink

(from coral through peach), red, magenta, maroon, yellow, cream and white. Petals often lighten at their tips giving the appearance of frosting. Flairs at the base of the petals are not unusual; and are sought after or despised depending on taste. Some people have even told us that the magentas (of all shades), are not worth growing. On the other side the name of the tree peony in Japanese (Butan) implies that the flower is magenta. We had a visitor last Spring who wanted us to dig up one of the plants from our personal collection because it was the very shade of magenta she had been seeking for many years. The idea of the "White Garden" is an interesting one, but well outside the idea of Chinese beauty.

We have found that photographs of the flowers are always unsatisfactory. Watercolors come closer, but there is nothing that beats seeing them in bloom. Colors and shades vary by time of day and age of the flowers. Some mudan are stingy with their flowers while others will produce sixty, seventy or more flowers after their tenth year. We have been told of old plants with hundreds of flowers.

After blooming, the plants present a lush background of dense greenery until frost. Some varieties have leaves that turn scarlet in the Fall, though most simply darken and die after the first frost. Many varieties produce fertile seed. These are not used in propagation since they do not produce plants or flowers in the same shape as their parents. Propagation of name varieties may be accomplished by grafting scions of one-year-old wood on to the roots of either tree peony seedlings or herbaceous peony roots, branch layering, and in some limited cases, root division. Detailed descriptions will appear in future stories. New varieties are produced by sowing a large number of seeds either from open pollination or purposeful crosses and selecting (after 8 years) worthwhile cultivars. The Chinese have used this method since the 7th century and now claim over 600 distinct cultivars.

"In front of the audience hall of the Emperor there were planted tree peonies with the thousand-petal shape. When the flowers first opened, the fragrance of their perfume was perceived by everyone. Each blossomed thousand-petaled shape, large, and deep red. Every time His Majesty gazed upon the sweet-scented luxuriance he would sigh and say 'Surely such a flower has never existed among men.'"

Fragrance is rather common among the blooms. It ranges from mild to dense, from sweet through woody, to spicy. We have had visitors to our garden claim that "they have not smelled anything like it since their childhood in China and the scent is making them dizzy." We have also experienced one very dark colored variety that had the smell of rot and was pollinated by carrion flies!

The direction of the flower's face is of interest to many gardeners. Most are up or side facing, but many of the very heavy doubles are down facing. We have not found the down facing varieties unattrac-

tive. As cut flowers, the down facing types are best floated in a shallow bowl. All others should be cut with short stems (6 inches) and can be placed in waterpics or wet floral foam.

The Chinese tree peony blooms over a two-three week period. Here in the northeast this is from mid-May to early June. In northern California, blooms are from early March to late March. In order to have flowers last as long as possible, we strongly suggest they be planted in dappled shade or 4 hours of sunlight. If they are planted in full sun, as some authors suggest, the plants will grow very rapidly but the flowers will be blasted in a day or two.

Plants need at least a 5-foot center when planted. They are difficult to move because of their deep root systems. Consideration must be made for their future size at planting time. They should not be planted directly under trees since many tree roots offer major competition for water. The mudan sends down very deep roots so the competition from annuals is not a problem when considering interplanting.

The best way to plant is to dig a 2-foot hole, removing all subsoil. Spread roots in typical cone shape and fill hole about half full of very good garden soil. A cup of bone meal and/or blood meal may be used if raccoons are not a problem in your area. Fill hole with water to insure that there are no air pockets. Fill remaining area again with very good garden soil. Again water to settle all soil. Try to use plants that are at least three years old.

We have found it a good practice to mulch new plantings with about 12 inches of material (leaves, etc.) This is only necessary the first year to protect new roots from heaving during the freeze and thaw cycles of Winter. We remove the mulch, a little at a time beginning in early April (about six weeks before blooming). Buds will be killed or set back if hit with a late Spring freeze. This problem is, of course, not limited to mudan. If late freezes are common in your area, we suggest planting 'late' varieties.

After planting, tree peonies require little perpetual care. They are susceptible to few diseases, the most notable of which is botrytis. To control the common garden ailment, we remove all leaf material as close to the first frost as possible. This measure does not allow the over-wintering and consequential reinfection of this disease in the Spring. We have found no large scale insect damage. The only problem we have ever had is a small infestation of carpenter bees that bore into the pith of older stems. We deal with them by poking a long thin wire (a bent paper clip) in the hole. We then seal the hole with clear glue or clay.

The Chinese tree peony is so desirable that it has been planted by the hundreds in the Imperial Gardens in Beijing. Millions of people visit Luoyang each year to see their Peony Festival. The Japanese were so taken with the plants that they have almost forgotten that they came from China. Definitions of garden beauty do come in

and out of fashion, but consider: many of the present cultivars of mudan are daughters or clones of plants that were growing in Chinese gardens thirteen hundred years ago.

If you would like to obtain a catalog of the 80 varieties of Chinese tree peonies we have available, please send \$3.00 to:

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CULTIVATION & ADMINISTRATION OF TREE PEONY IN POTS

*By Wu Jing Xu, General Manager & Senior Agronomist Working in
Luoyang Huafeng Ltd. Co. of Peony & Horticulture*

(Address: No. 3 Daonan Rd., Luoyang, China)

Can tree peonies be potted under normal conditions? The answer is yes, and the key of potted peony plants is to keep the root system growth well, and the plants to have enough nutrition. To be successful in the cultivation of tree peonies in pots is not difficult.

I. Cultivars and plant ages. In general, the suitable cultivars to be potted have a feature—that is—shorter stem and internode of dwarf forms. However, other cultivars are also possible to be potted. But one should remove unnecessary buds, and weak branches pruned, because the nutrition areas in pots is little, the selected cultivars must grow strong and resistant, to not flowering until older. For example, "Luoyang Red," "Zhao's Pink," "Hui's Red," "Ammitation of Lotus Flower (Shi He Lian)," "Zhu Sa Lei (Cinnabar Beauty)," "Yin Fen Jin Lin (Silver Powder and Gold Scale)," "Wu Long Peng Sheng (Black Dragon Holds a Splendid Flower)," "Lou Fen (Lou's Pink)," "Ce xia (Rosy Clouds)," "Ya Pian Zi (Opium Purple)," "Feng Dan Bai (Phoenix White)," and so on. Ages of the plant should be from 2 to 8 years old.

II. Pot and Substrate. The best pot is tile pot in China. The size of pot should be decided according to the size of a plant. The size of pot is generally a depth 30 to 40cm and a diameter 25 to 30cm—it is suitable for planting peony plants. Because Moutan root system is succulent roots, so the straightly tubular of pot shape is better than others.

Taking into the substrate (soil) of potted plants, whereas very developed and fleshy root of Moutan plants is easy to rot and die due to water stored, or mal-development because of nutritional inadequacy under potted conditions. Therefore, the key of potted plants is to choose porous, fertile substrate and have proper water. In general, the substrate recipe (composition) made in the proportion of paddy field soil (or garden soil) 6 and humus soil 4, and so on.

III. Transplanting and Repotting. The most suitable times of transplanting is about the middle ten days of October in Luoyang city of China, with plants coming from the field. At this time, firstly put a piece of tile or plastic in the bottom of pot, then load some bigger granular soil (substrate), and stroke the roots rightly and put the plant in the pot covered with soil.

To existing (ready-made) miniature potted tree peonies should be repotted once each 2 to 3 years, transplanted plants to the bigger pot from smaller old one. At the same time, the substrate is also exchanged by using common culture soil not adding fertilizer. After planting, the potted plant is put in a place where sunlight is enough, and ventilation is well and cool. Avoid strong light to a lesser light in Summer.

IV. Fertilizing. From the first ten days of May, application to manure compound fertilizer or organic fertilizer such as cake, fishing dregs or humus bone meal, etc., in a triangle or ring once every month per pot using 20 to 100g at a time. In rainy season, spraying 20 to 50g Fesox over the pot at a time, and for 1 to 2 times every year. In growing season, spraying 1 to 3% KH₂PO₄ to branches and leaves in 2 to 3 weeks.

V. Watering. After the soil surface of pot becomes white and dry, water at once, but not too much. After potted plants are sprouted, water once every 3 to 5 days in the Spring. However, when the main sprout grows to about 10cm length, the watering should be lessened in order to promote flower bud development. Watering once should be done every 2 to 3 days after the flower has fallen.

VI. Erasing Buds and Form Pruning. In order to make the tree peony plants bloom well every year, the aim of form pruning is retained one flower bud per branch. Flowering numbers in one plant should be 2 to 3, 4 to 6 and 7 to 10, in 2-3, 4-6 and 7-10 year old potted plants. When the buds germinate in Spring, retain 2 to 3 buds of growing branch in upper parts. Other buds are removed. After the bloom has fallen, in order to avoid producing seed and saving nutrition, remove spent flowers.

To keep a good plant in shape and promote flower buds differentiation, prune out thin and weak branches and upper parts of other branches of which 2 plump buds should be retained on the lower parts.

★ ★ ★ ★

***If you cut a tree, plant a tree.
It is nature's replaceable energy.***

FROM DR. CHENG FANG-YUN

*Dept. of Biology, Northwest Normal University,
Lanzhou, Gansu, P.R. China 730070*

Dear Ms. Kessenich,

Thank you for your mailing of all 1995 *Bulletins*. During the blooming dates of peonies, we recorded and described our cultivar plants again in Peace Peony Nursery, and selected some new plants as candidates of cultivars which will be identified in a few years.

In the past 30 years, Mr. Cheng grew more than 100,000 blooming Moutan seedlings, which originated from the seeds produced by the cross between traditional Mudan (*P. suffruticosa* cvs.) and Gansu Mudan (*P. rockii* cvs.). Nowadays, these two have been considered as the two main cultivar groups of Chinese tree peonies, and both of them have their own features and spreading. Since 1994, we have begun to do crosses between these cultivars and species plants, as Lutea, Ludlowii, Delavayi, and so on. The gene of delavayi group was not included in the cultured tree peonies in China.

Through investigation I found that a great complex was not only included in the breeding practice of tree peonies but also in our knowledge about this subject. In the latest *Bulletin* I was glad to read "a thinking about the species tree of tree peonies," but felt that there were some basic mistakes existing in this article. In fact, this theme is concerning the relationship between species and cultivar groups in which I have been very interested for several years. It is a pity that only a few scientific researches have been carried out in the past which should be necessary to establish a natural tree among species and their cultured varieties. After investigations of many historical literatures and records, I outlined the cultural history of tree peonies in China, Japan, and other countries. Now, with the assistance of two under-graduate students, I am engaged in the morphological and anatomical studies on the various species and cultivar groups growing in China, and hope some information will be useful.

★ ★ ★ ★

INTRODUCTION OF A FEASIBLE METHOD TO PROPAGATE TREE PEONIES FOR AMATEURS

Dr. Cheng Fang-yun

(Department of Biology, Northwest Normal University, Lanzhou, Gansu 730070, P.R. China)

"For a real flower lover never to make the acquaintance of the tree peony is to miss one of life's most pleasing experiences," described on page 17 of the latest *Bulletin* (No. 296). It made an apt description of this hardy shrubby plant. This is not difficult to be understood in China, for a general idea, "If Mudan or tree peonies are not grown, it would not be a garden." Chinese gardeners and land-

scape architects have grown them since the ancient Song Dynasty, more than 1000 years ago. That Mudan is called "the King of Flowers," means that it leads all other flowers in a garden. Today, this flower native to China has been introduced into gardens of many other countries, and is becoming more and more popular. Someday, it is possible in these countries that the situation of "not a garden without Mudan" will be the same as in China. But the difficulty in propagation is slowing the spreading of tree peonies so that currently many people very interested in this wonderful plant in the West still have no chance to see it.

Tree peonies, Mudan or moutan can be propagated by division, by layering, by cutting, by root grafting, and by seeds, but how to propagate them more rapidly is always still a big problem troubling every peony man, because the four vegetative or asexual methods mentioned above have not a satisfactory reproductive rate, and the seeds cannot be used for the increase of stocks of named cultivars. At the present time, when various advanced techniques in agriculture and horticulture have been developed, it is regrettable to say that compared with those used in ancient China, today's methods of propagating tree peonies have not been improved very much, in China, as well as in other countries.

Here, I am going to introduce a feasible one to amateurs, by which they can effectively increase their favorite Mudan plants growing in gardens. My important purpose to do so is to "toss a brick to attract jade." I hope more attention of horticulturists could be focused on this subject to make tree peonies available to more lovers of gardens.

As a method by which plants can be propagated, air layering is not a new one to gardeners because it was practiced by the Chinese thousands of years ago, but as described in J. Wister's book, *The Peonies*, it was not successfully introduced to propagating tree peonies as done in China. In late years, the experiences in Gansu Mudan of China make me feel that it is a feasible way to increase plant numbers, especially to amateurs. Here its details will be dealt with as follows.

Cultivars — various semi-double and double cultivars of Gansu Mudan, the secondary larger cultivar group of Chinese Mudan, and derived mainly from the species *Paeonia rockii*. Were experimented on in our study separately at the Peace Peony Nursery, Northwest Normal University and Lin-tao County. The plants used were more than ten years old and one meter high.

Air Layering composed of three steps including girdling hormone treatments and air layering.

1. Girdling: Selected stems must be ones developed from buds in this growing season, that is, they must be twigs with the age of less than one year. Anatomical study showed that the twig was primary

growth before blooming, and began secondary growth after blooming. During blooming period, twigs were semi-woody and girdling was very easy because cambium cells divided actively to form a cambium zone with a thickness of about ten cell layers, but these derivations did not differentiate into secondary xylem and phloem. So when it is in bloom it is the right time to girdle twigs. If earlier, the damage will be larger so that twigs will be unable to grow normally and will wither and die. If later, the increase of the secondary structure will make callus, and further root formation become more difficult.

Girdling location was about 0.5cm from the petiole of the second leaf at the base of twigs and the girdled ring was 1-1.5cm wide according to the vigor of plants. If the girdling was too narrow, the callus formed from two cuts, above and below, will connect together with each other so that the girdling becomes meaningless. When too wide, the girdling will have an influence on the normal growth of the stem so that the leaves often become yellow earlier than normally, and meanwhile the stem will become easy to be broken off with the weakened resistance to wind.

The girdled ring can prevent various substances (including some regulators such as various hormones) produced in leaves, from being at the location of the above cut, which is very helpful to callus development and root formation.

2. Hormone Treating: A critical step concerned with the success of this method is whether the girdled twig can regenerate its own roots. As it is well known that hormones can determine the nature of regenerated organs, we treated girdled twigs with ABT rooting power (a hormone compound) and IBA in three different solutions. We found 60 p.p.m. was the best solution to treat. All that we did was water some cotton yarn in hormone solutions for a while and then lightly wrap the girdling cut with them.

3. Bagging: Bagging is to create a suitable micro-environment for the formation and development of callus and root. At first the girdled part of twig was surrounded with Polyethylene film and tied its below end tightly so that it was fixed. Then the medium was filled in a Polyethylene bag like a cylinder and, at last, the above open was closed with needles. What should be taken care of in this operation is as follows: (a) The bag should have a diameter of 8cm and 15cm high; (b) Girdling cut should be located in the upper part of bag one-third from its above end so that future roots will have enough space to grow; (c) Medium fillment must be tight and; (d) With an injector water throughout the medium at the first time only after bagging and then, when needed, water to keep the medium moisture in the bag.

Rooting rate of girdled twigs was different in different kinds of media like in cutting of many other plants, we separately used slag, coal powder and vermiculite, and found the first was the best one, in

which more than 70 percent of stems treated with 60 p.p.m. ABT or IBA produced their own root well. Perhaps moss is a good medium for this purpose but it was unavailable to me at that time.

Root Formation and Transplanting Rooted "Plant"

1. **Root Formation** — After 15 days of air layering callus swell began to appear from the cuts and after 30 days covered the whole cuts. Callus increased rapidly in its volume in 60 days but after then such increase became not obvious while the adventitious roots began to be seen.

Root was regenerated from girdled stems in various way. In other words, a variety was included in rooting. Three distinct types of rooting were divided (fig.): 1. Callus-rooting type: The majority of stems belonged to this type in which the roots were produced directly from callus; 2. Cortex-rooting type: The less stems were included in this type. Their root development seemed no relation to callus, which could exist or not; 3. Complex-rooting type: Roots came from both callus and cortex, but a few samples were observed to form roots in this way. In fact, as shown in the figure, in some cases a lot of roots appeared abruptly and crowdedly in a fixed location of callus or cortex (fig. A1, B2), but in other cases they produced gradually and scatteredly in various places (fig. A2, B1, B3 and C).

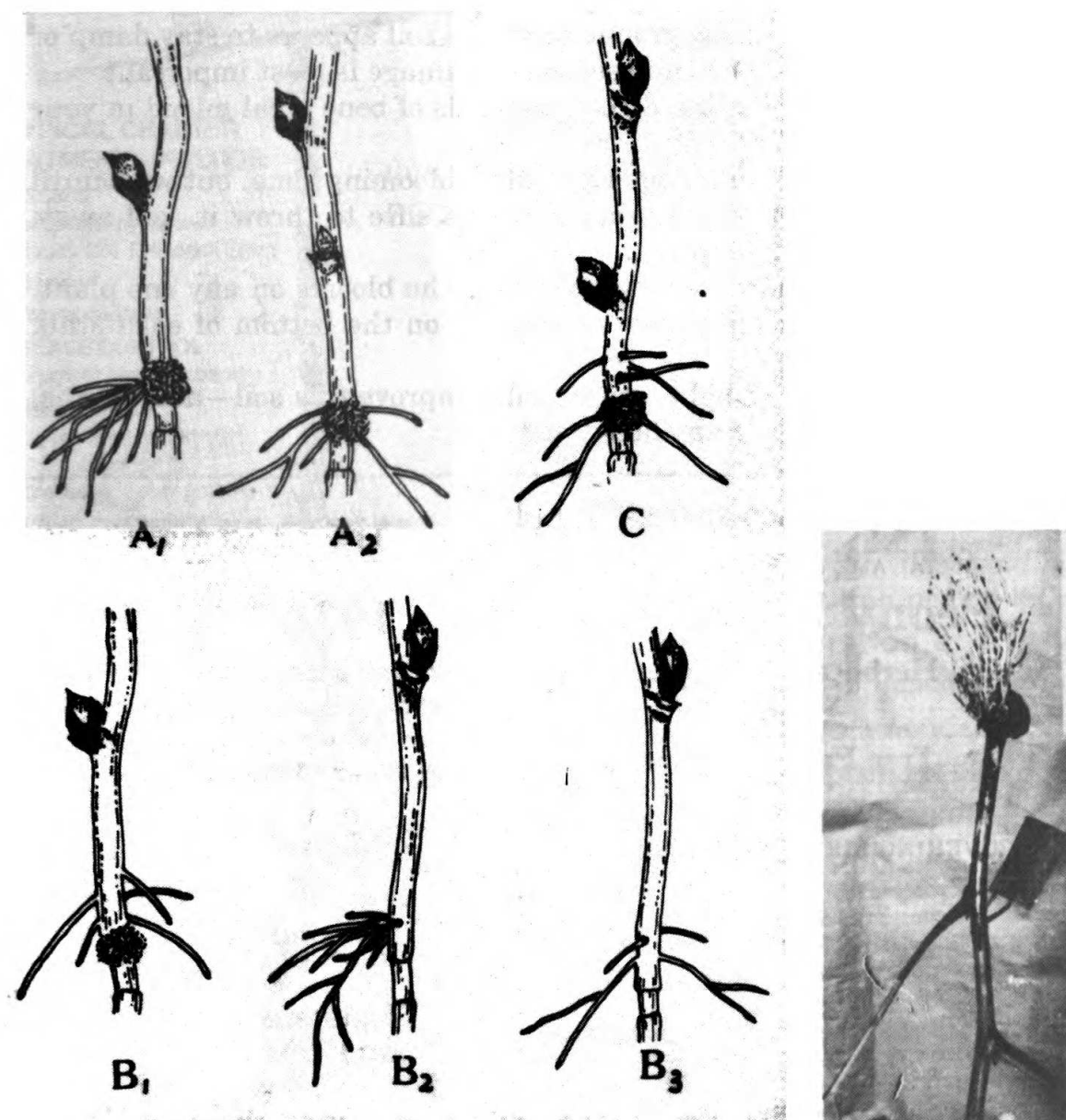
2. **Transplanting rooted "plant"**—4-5 months after air layering, some roots in the stems had been longer than 10cm (picture) and could be seen from the outer of Polyethylene bags. At this time it has gone into Fall which is traditional time to plant tree peonies. Cut off air layerings, take off Polyethylene film carefully, and with original medium replant them in the prepared field. The first water after replanting should be throughout, but the soil harden should be prevented, which is important to assure the living of these new "plants."

It is necessary to give some mulches in the Winter of the first year. Generally, all of stem's layerings with roots of their own will grow into a seedling the next Spring. If the top bud is damaged in transplanting, the next one below it will develop later in this growing year. If all buds of a layering is damaged, new ones will form from the underground "crown" of the plant and grow the next year. After the growth of three years, layerings will have become vigorous plant bushes and can bloom as usual. These plants produced by this method are dwarfed and right for pot-planting with the well developed root-system of their own.

Some Thinkings — Tree peonies have become more and more popular in many countries in addition to China, but propagation problem makes them have too high prices to be available for more people. In China, England and Holland, studies on this subject had been carried out to propagate Moutan in vitro by tissue culture method. However, the results of these studies were unsatisfactory as this method was still impracticable. As we know, cutting is very

tive to reproduce many flower plants but not used successfully in tree peonies. In air layering, we found that layering or stem can root in various ways, which, in the common knowledge of horticulture, means that the cutting of tree peonies should be easy to root. As suggested in one of my papers (*Acta. Hort. Sinica*, 20:176-180, 1993), we should try to propagate tree peonies from the cutting in improved culture conditions. As soon as the same living rate as grafting was gotten, cutting should be a more simple, effective, and useful method to propagate tree peonies.

Fig. Rooting Types of the Girdled Twig in Gansu Mudan



**A: Callus-Rooting Type; B: Cortex-Rooting Type;
C: Complex-Rooting Type**

**(Picture)
A twig with its
own roots.**

FROM WRITINGS OF LATE CLARENCE LIENAU

During blooming time make your selection of peonies. Ask advice about the strength and dependability of the various kinds. There is a very wide variety in peonies, when you take into consideration doubles, semi-doubles, singles and the so-called "Japanese" types, plus the fact that there are early, midseason and late-blooming ones in each group, as well as a great range of colors, from white through all shades of pink, and on into crimson.

A normal blooming season for the lactifloras (our common or garden June-blooming peonies) would be three or even four weeks. By adding a hybrid or two to your list, you may lengthen out the season of peony bloom by as much as a week or even ten days.

The following is very important.

DON'T plant in low ground or where soil appears to stay damp or soggy at any time, or in any season. Drainage is most important.

DON'T over-fertilize: 3 good handfuls of bone meal mixed in your soil is sufficient for three years.

DON'T cut down foliage right after blooming time, but wait until Fall. Then cut it to the ground and be sure to throw it well away. (Not on a compost heap!)

DON'T cut more than two-thirds of the blooms on any one plant. When cutting blooms, leave two leaves on the bottom of each stalk remaining.

DON'T plant in light, sandy soil. Improve this soil—add humus, garden loam, clay, or any heavy soil.

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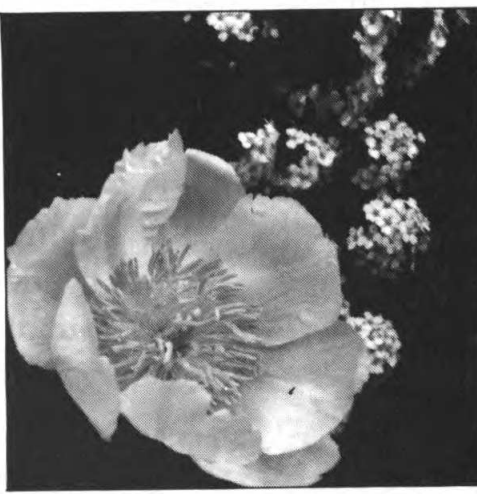
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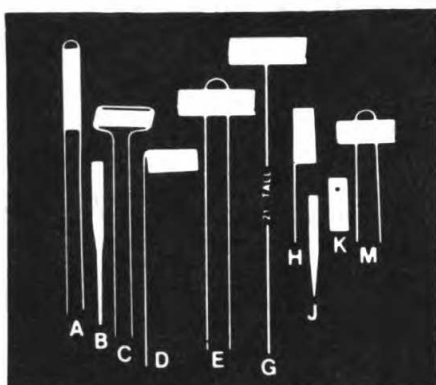
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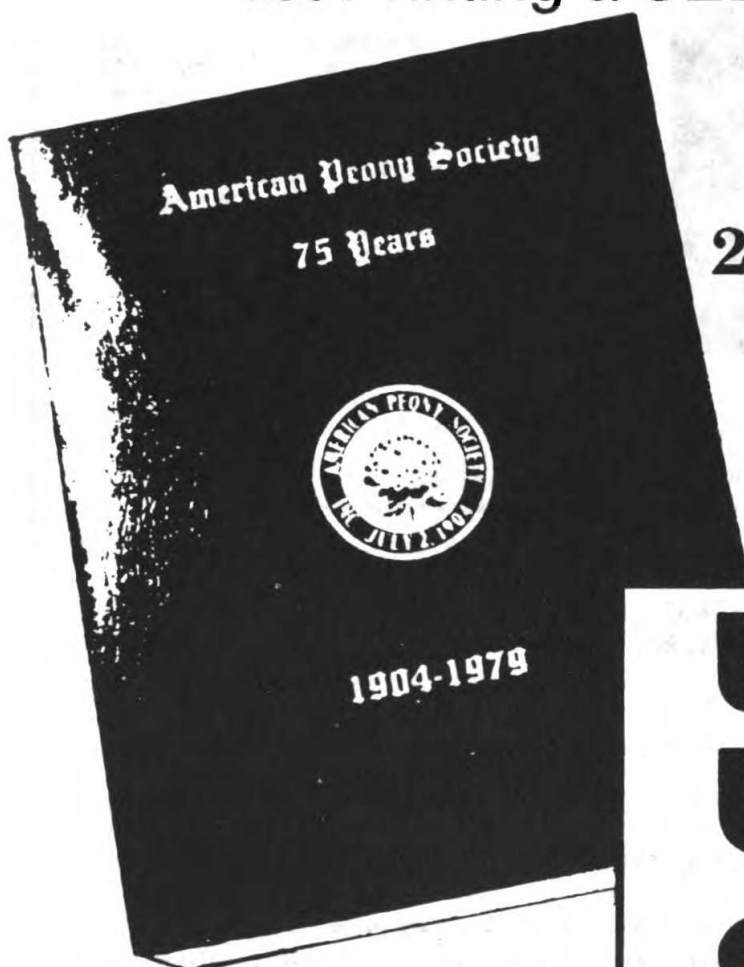
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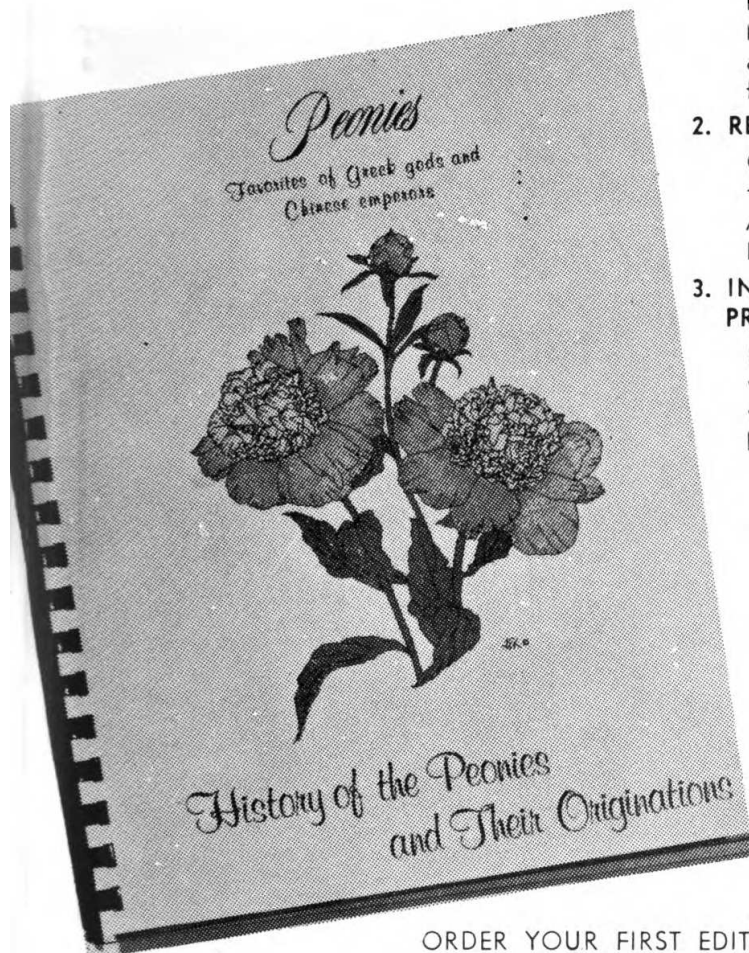
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Waucedah Princess

(Reath) Tree peony,
full double with
forty or more
petals. Flower is
lavender pink,
flared and ruffled.
Dark lavender
flare in center can
be seen through
the array of petals.



Photograph: Klehm Nursery



Alice in Wonderland

(Reath) Tree peony,
a near double
with thirty petals.
This bright yellow
flower has flares
that are a blend
of red and maroon.

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Salmon Dream
(Reath) Herbaceous
hybrid. Pale
salmon pink,
semi double,
early bloom.
30 inches in height.

